Armed Forces College of Medicine

AFCM

Tumors of The Nervous System 2

By

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Good
Morning

INTENDED LEARNING OBJECTIVES (ILO)

By the end of this lesson the student will be able to:

1-Discuss Cerebellar tumors
2- Describe pathological changes of Medulloblastoma.
3- Identify cerebral lymphoma and metastatic tumours.
4- Distinguish the Pathological Features Of Meningioma, Schwannoma, and Neurofibroma.
5- Analyse given data to diagnose pathological conditions of tumors of the nervous system based on given clinical, radiologic data and/or laboratory findings

Cerebellar tumors

1. Pilocytic astrocytoma (Discussed)

2.Medulloblastoma

3.Hemangioblastoma

Medulloblastoma

Tissue of origin: neuroepithelial stem cells

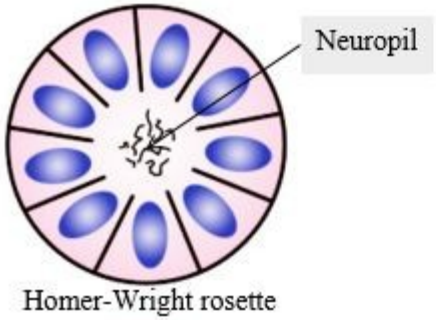
- Primitive Tumor *in* young child.
- It is a highly malignant (**WHO grade IV**) rapidly growing tumor that **exclusively** occurs in the **cerebellum** of **children or less commonly adults**.
- The tumor arises at the **midline**, but may rarely occur in one of the cerebellar hemispheres.

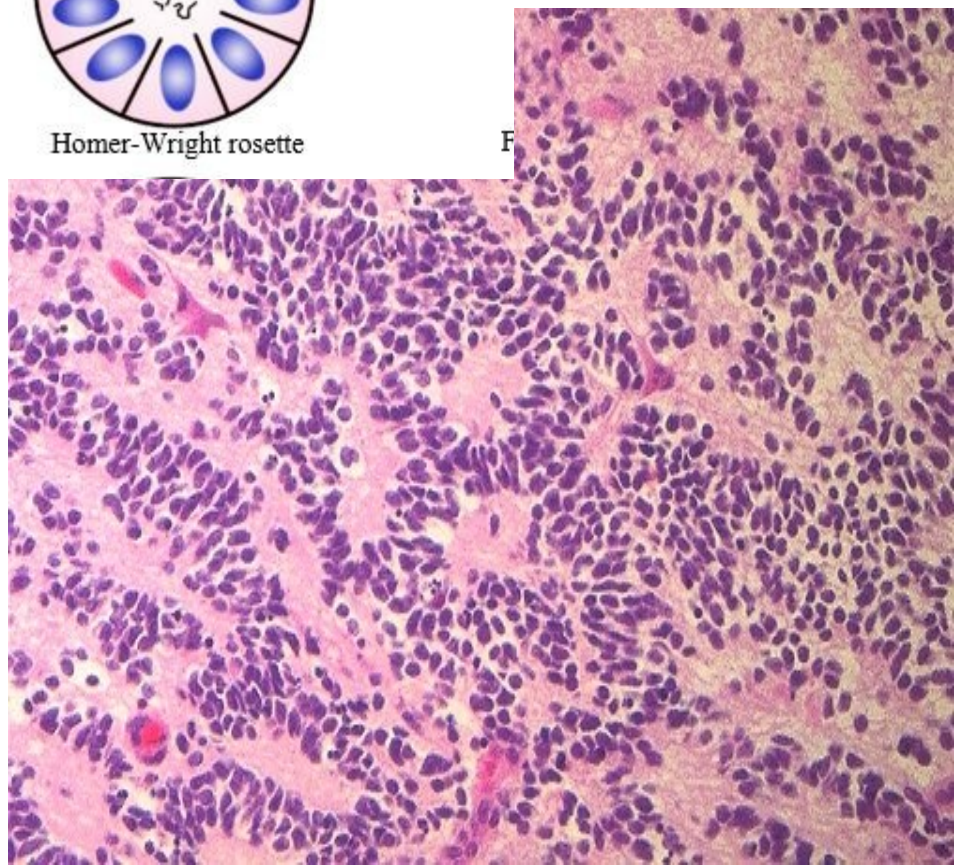
Gross: An infiltrative mass with areas of necrosis and

Medulloblastoma

Microscopically:

- The tumor consists of **primitive small oval** cells with dark nuclei and little cytoplasm.
- The cells forming **Homer Wright rosettes** characterized by tumor cells surrounding central **neuropil (delicate pink material formed by neuronal processes).**
- Necrosis and mitotic figures are frequent.





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Hemangioblastoma

Occurs commonly in the cerebellum,

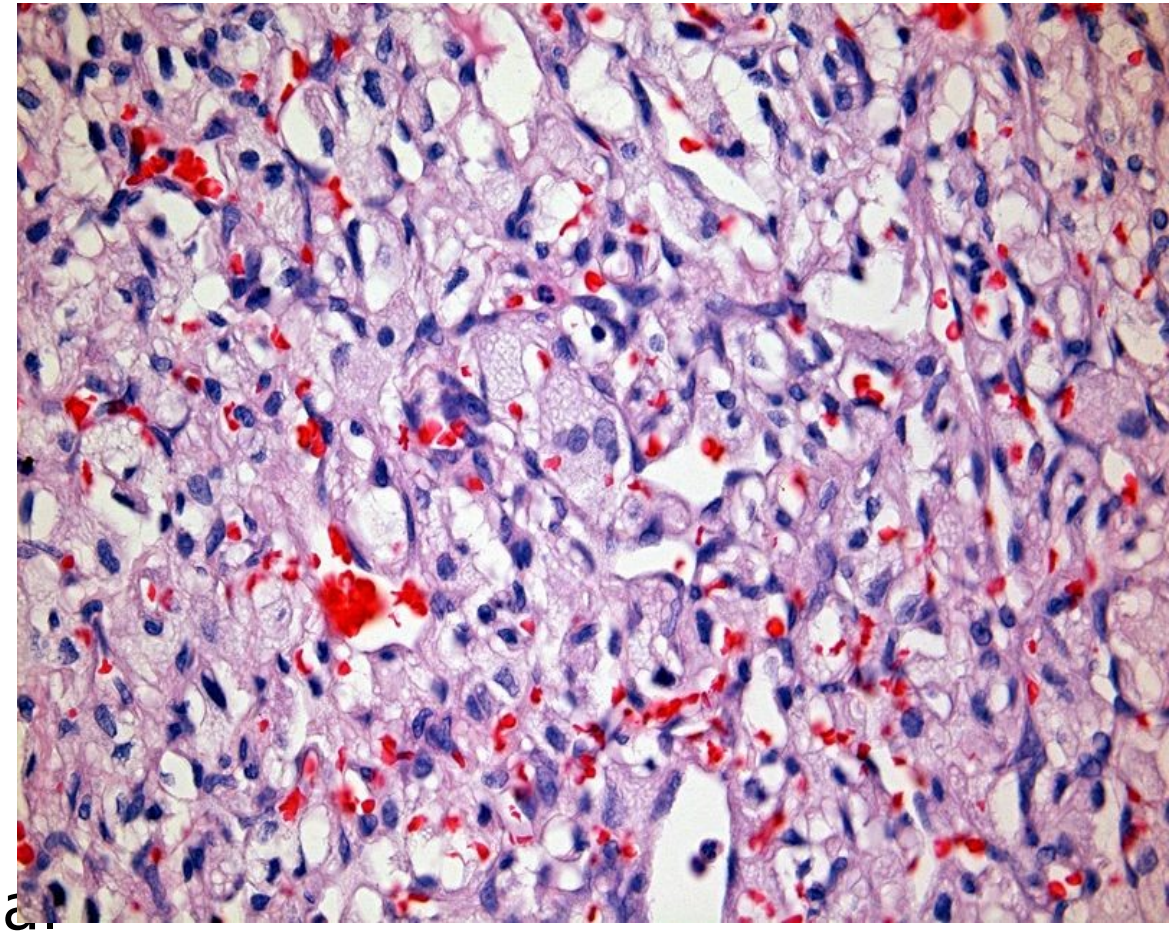
less commonly in spinal cord and brain

stem

Gross: Cyst with mural nodule pattern
Microscopically:

Vascular neoplasm formed of **capillary sized vessels** separated by **stromal cells with lipid rich vacuolated** cytoplasm

Prognosis: The outcome for hemangioblastoma is very good, if surgical extraction of the tumor can be achieved.



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Metastatic tumours

About 25–50% of all CNS tumours are metastatic tumours from outside the CNS.

Carcinomas are the most common.

They may be derived from:

1) Carcinomas: (e.g bronchogenic, renal, and mammary carcinoma).

2) Sarcomas

3) Others

-Melanoma

-Lymphomas or leukemia

Other CNS Neoplasms

Lymphomas:

- They are the most common CNS tumours in **the immunosuppressed**.
- Primary CNS lymphomas may be **multiple**, unlike other histologic types.
- They do not respond well to chemotherapy.

Meningeal tumors (Meningioma)

Definition: It is a relatively common tumor arising from **dura or leptomeninges.**

Most examples occur in **adults females**.

Grading and types:

- Most cases are benign **(WHO grade I)**

-Atypical **(WHO grade II)**

-Anaplastic **(WHO grade III)**

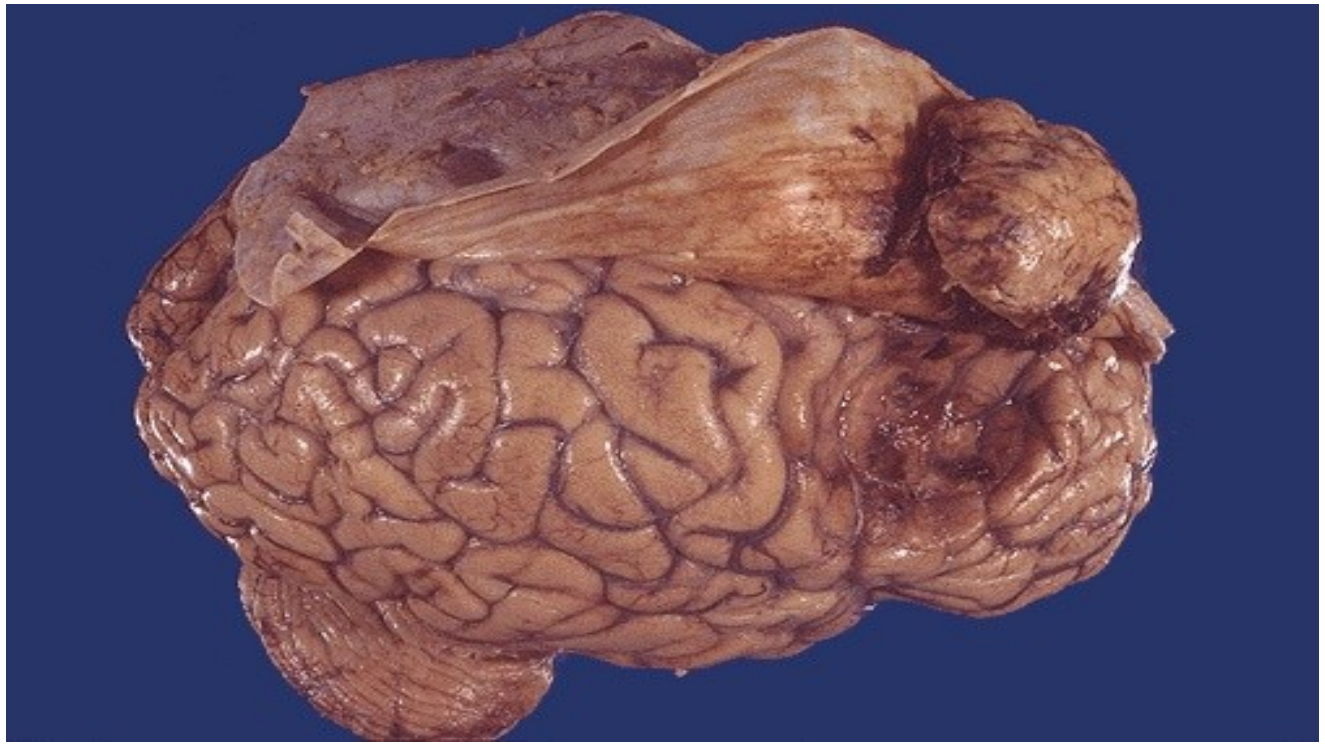
-

Meningioma

Gross: Most types of meningioma form **a globular capsulated firm** greyish mass.

The cut surface may show **whorly** appearance and calcific foci.

The tumor may compress the brain or spinal cord.



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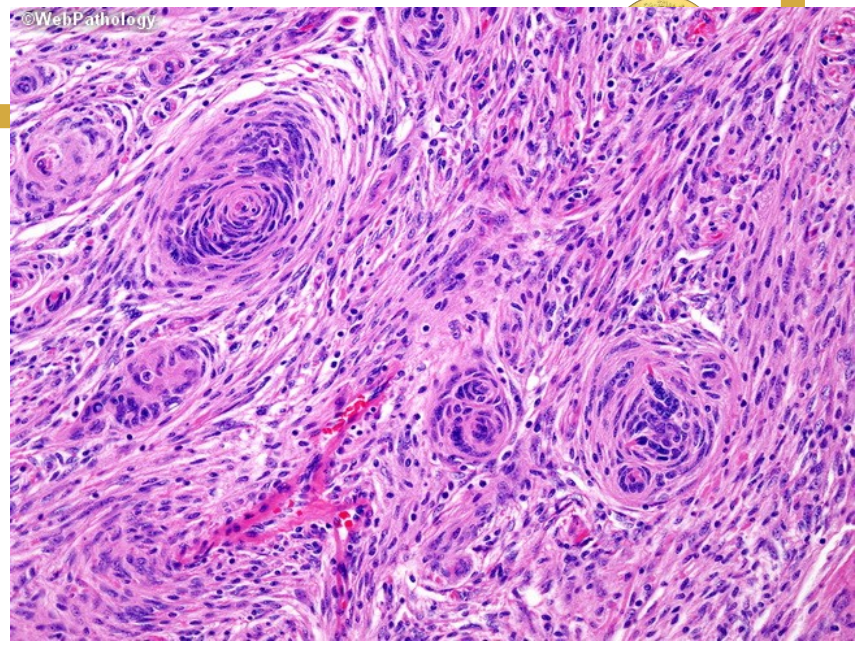
Meningioma

Microscopically :

- The tumor consists of **concentric whorls** of proliferated meningothelial cells (oval cells with indistinct cell borders, pale cytoplasm & regular round nuclei).
- Cell whorls are separated by **fibrovascular stroma.**



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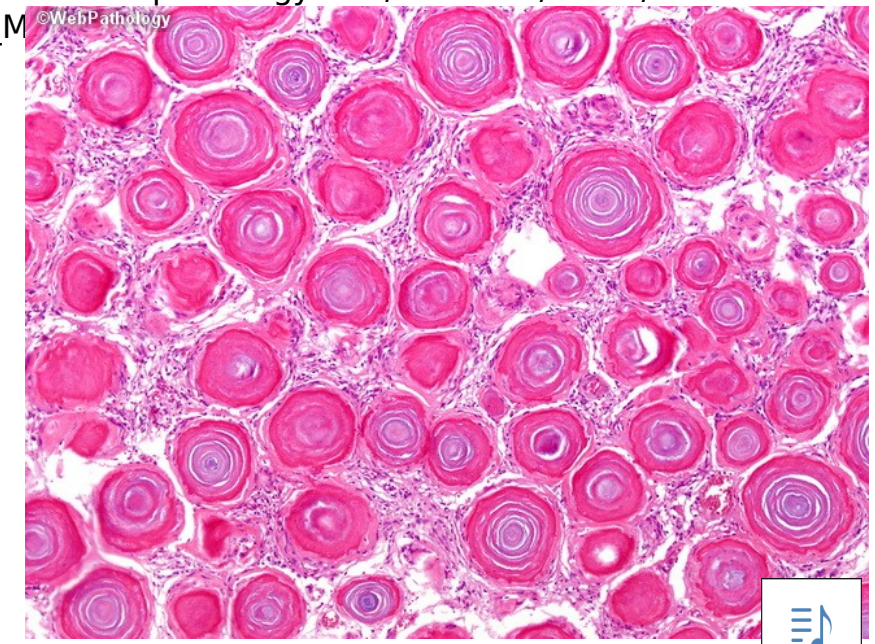


Peripheral Nerve Sheath tumors

They arise from peripheral nerves (cranial or spinal nerves) including the nerve roots.

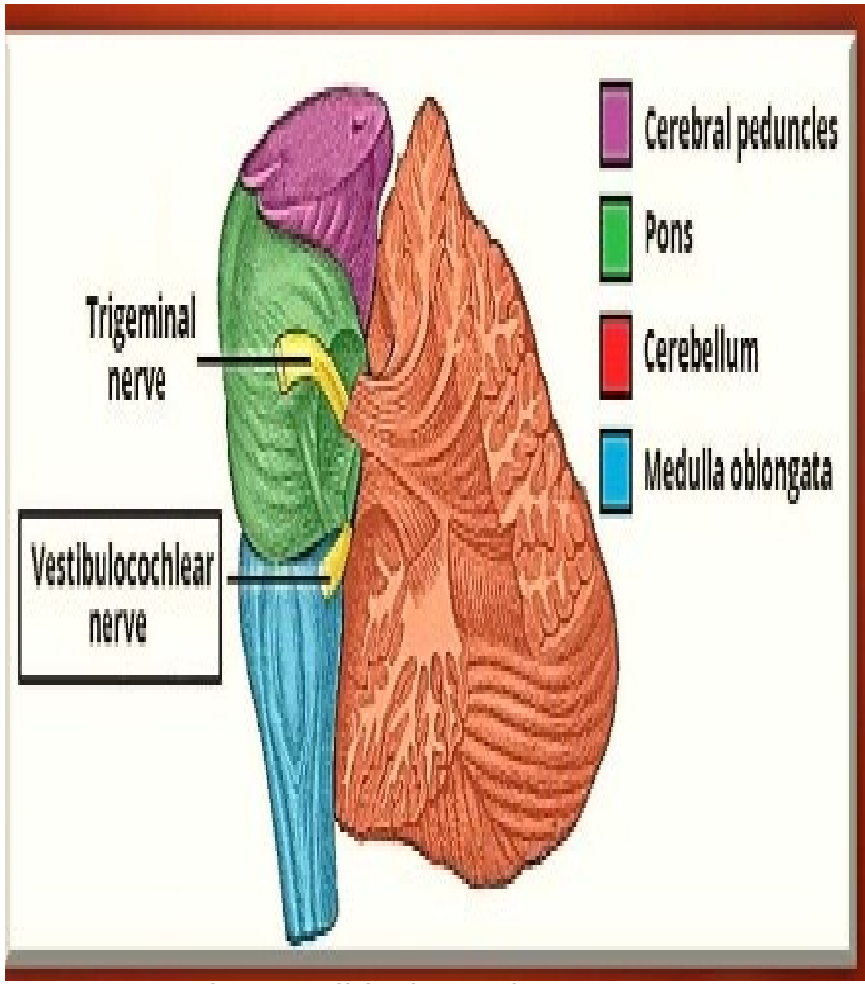
1. **Schwannoma.**
2. **Neurofibroma.**
3. **Neurofibromatosis.**
4. **Malignant peripheral sheath tumor.**

SCHWANNOMA (NEURILEMMOMA)-1

- A benign tumor arising from **Schwann (neurilemma) cells** of the peripheral (cranial or spinal) nerves.

Gross:

- A firm greyish capsulated mass at one side of the nerve.
- **The 8th cranial** (acoustic) nerve is one of the famous sites of schwannoma that present with **unexplained progressive unilateral hearing loss.**
- A tumor in this site (**cerebellopontine angle**) leads to compression **of midbrain and cerebellum.**



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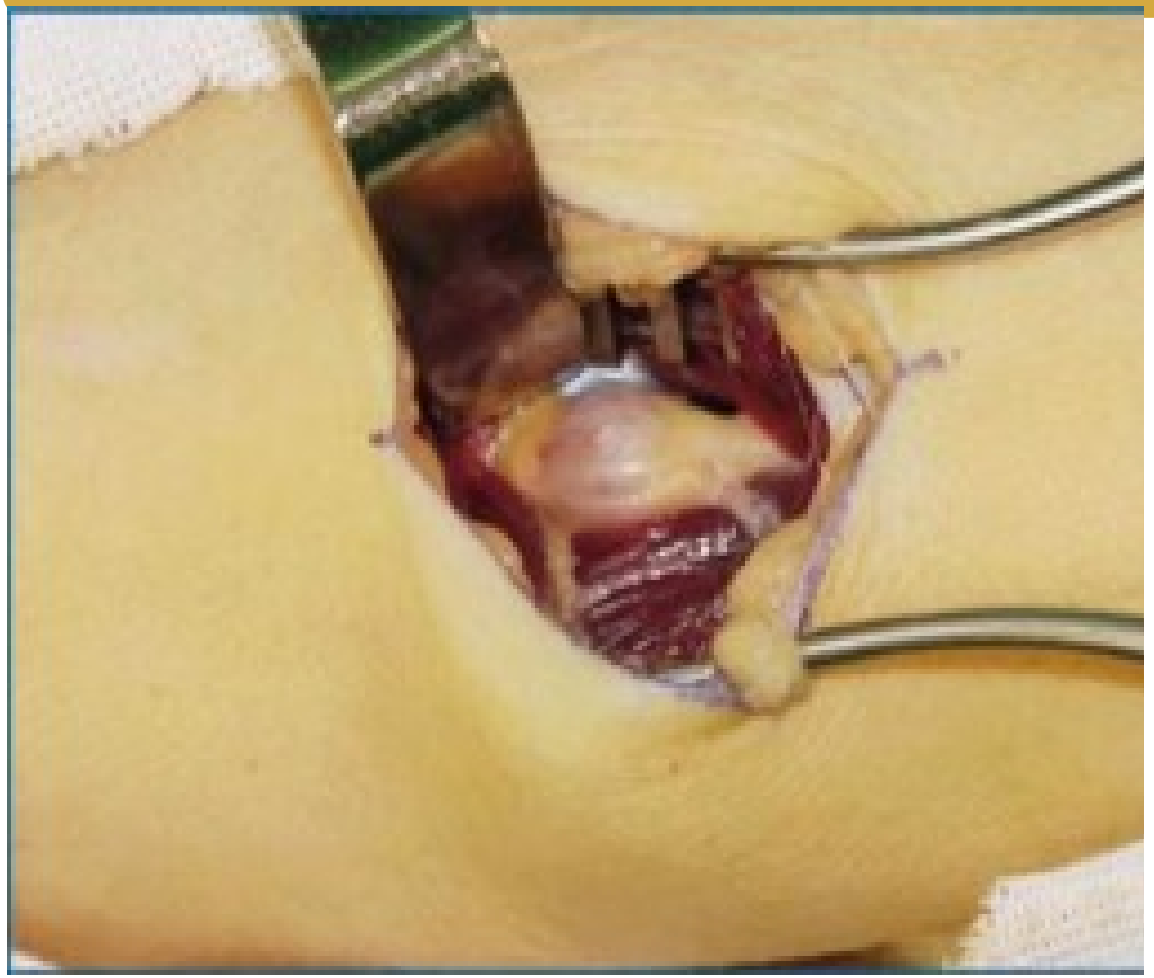
SCHWANNOMA (NEURILEMMOMA)-1



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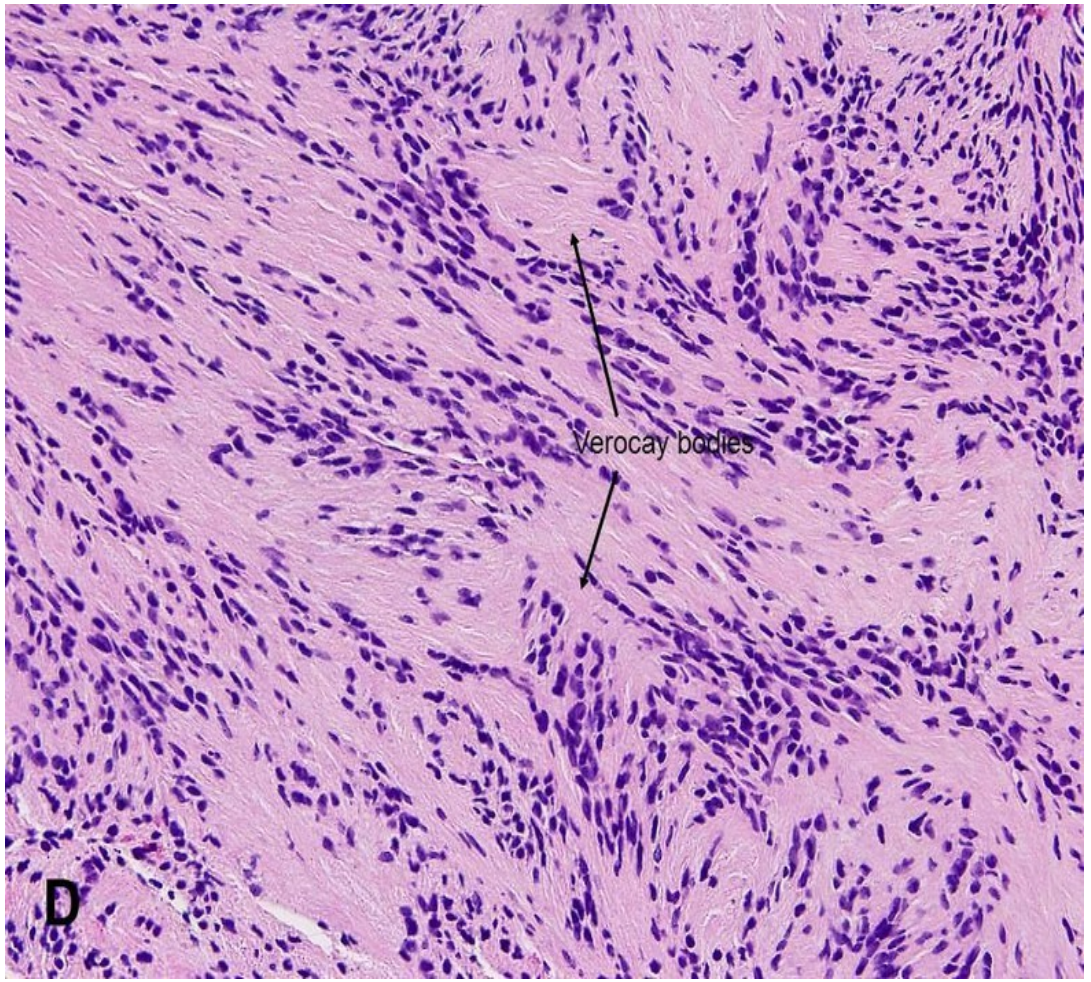
SCHWANNOMA (NEURILEMMOMA)-1

Microscopically: The proliferating Schwann cells have one or both of two patterns:

a)Antoni type A: formed of elongated cells arranged in bundles with nuclear **palisading** (the nuclei are arranged side by side in each bundle) the cytoplasmic nuclear free zones are called **"verrocay bodies".**

b)Antoni type B: Formed of **less densely cellular** elements arranged



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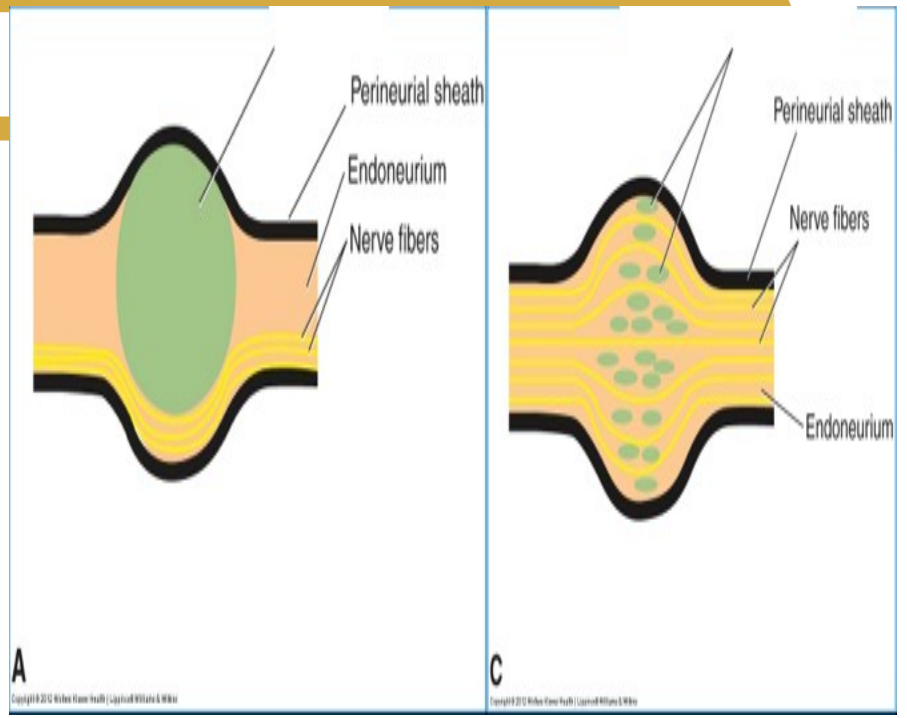
Neurofibroma-2



It is a benign nerve sheath tumour of the peripheral nerves

Grossly appears as a rubbery expansion of the affected nerve, not demarcated from the nerve

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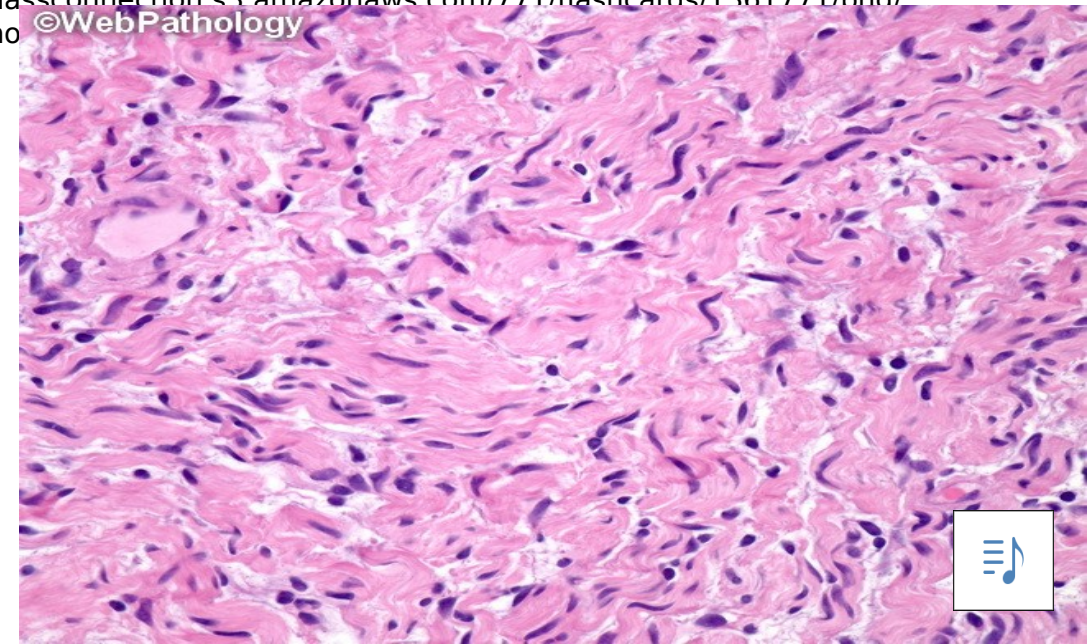
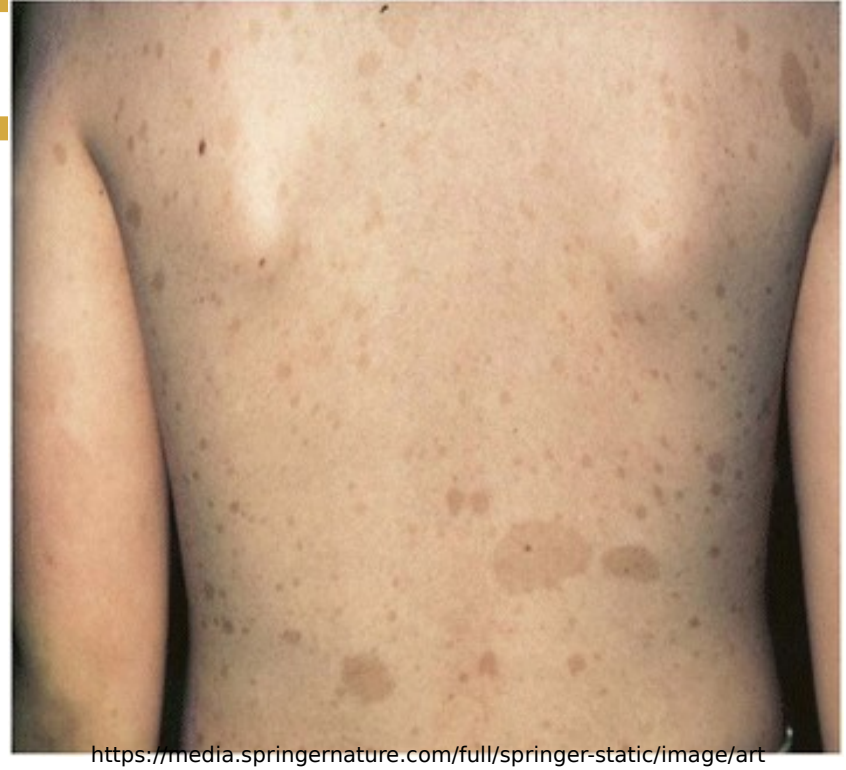
Microscopically, composed of **fibrous** tissue intermingled with **Schwann cells and nerve fibrils**



Neurofibroma has a significant risk of malignant transformation

Neurofibromatosis



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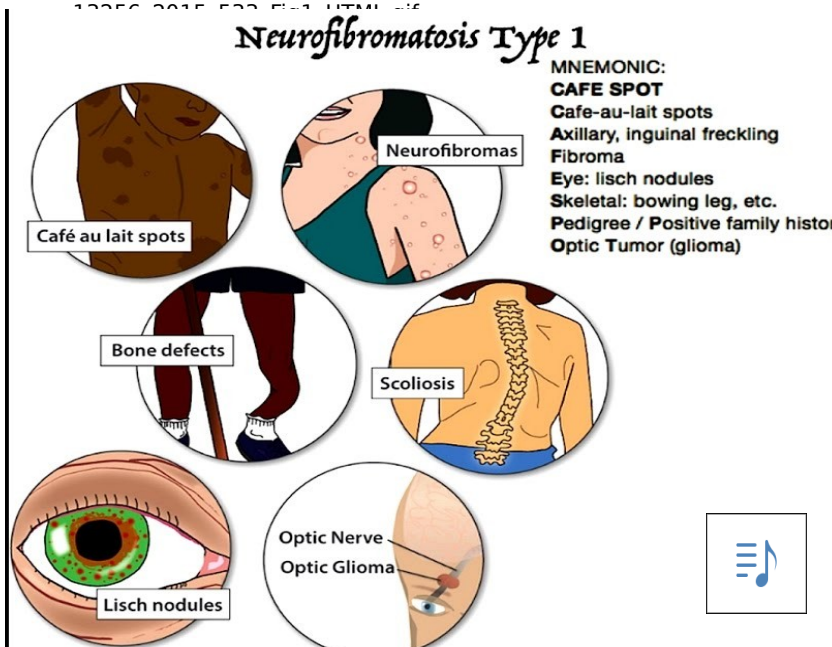
(Von Recklinghausen's disease of nerves)

It is a familial disease **(autosomal dominant inheritance)** of two types:

Type I (NFI): is characterized by:

-**Multiple neurofibromas**; mainly cutaneous.

-**Cafe au lait spots** (hyperpigmented skin macules).



-**Eye lesions:** a)Optic nerve gliomas

Neurofibromatosis

Type II (NF2): It resembles **type I without eye affection**

4-Malignant Peripheral Nerve Sheath Tumor

- Occurs de novo or
- Complicates neurofibromatosis

Quiz

1- which of the following is micoscopic finding in meningioma :

a) Pseudorosette

b) Hommer Wright Rosette

c) Verrocay bodies

d) Psammoma bodies

Complete:

2- ..... is a common site of schwannoma

3- Most of the cases of meningioma presented grossly as.....

References

1. Kumar, Vinay, and Abbas, Abul K, and Aster: Robbins Basic Pathology, 10th)ed. (2018) Pages 880-887.
2. Mohan H., Mohan P., Mohan T & mohan S. (Eds.). (2015) Text book of pathology 7 th edition


Good Luck